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10/602,945	06/24/2003	John F. Grubb	RL-1627DIV	1816

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EXAMINER
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DOVE, TRACY MAE

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1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/602,945  
Filing Date: June 24, 2003  
Appellant(s): GRUBB, JOHN F.

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 7/6/09 appealing from the Office action mailed 6/5/08.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,613,468 B2	SIMPKINS ET AL.	9-2003
5,424,144	WOODS JR.	6-1995
JP2000-294256 A	TARUYA ET AL.	10-2000

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

*Claims Analysis*

The claims recite the terms "up to", "less than" and "no more than", which all encompass the value zero.

*Claim Rejections - 35 USC § 103*

Claims 36-40, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpkins et al., US 6,613,468 in view of Taruya et al., JP 2000-294256, as evidenced by Woods, US 5,424,144.

Simpkins teaches a solid oxide fuel cell comprising an electrolyte 40 disposed between and in ionic communication with an anode 30 and a cathode 50 to form an electrochemical cell 10. The solid oxide fuel cell further includes an interconnect 24 (Figure 1; 2:61-66). The solid electrolyte may comprise zirconium oxide (zirconia) (3:20-42). The interconnect is electrically conductive and may comprise a ferritic stainless steel material (6:46-67).

Simpkins does not explicitly teach the ferritic stainless steel composition of the claimed invention, but does disclose the interconnect may be a ferritic stainless steel material.

However, Taruya teaches a fuel cell comprising a separator (interconnect) having a specific ferrite stainless steel composition. Respective component elements of the ferrite stainless steel composition are 10.5-35 wt% of chromium, 0-6 wt% of molybdenum, not more than 0.018 wt% of carbon, not more than 0.2 wt% of titanium

and not more than 0.3 wt% of niobium (abstract). The ferrite stainless steel separator may be contained in a fuel cell (0020). Taruya teaches the molybdenum range is preferably 0.5-5 wt% of the ferrite stainless steel composition (0041). Taruya is silent regarding the claimed properties of the ferrite stainless steel. However, since the compositional limitations are disclosed in Taruya, then the recited properties would have been inherent in the teachings of Taruya absent any proof to the contrary.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the ferrite stainless steel composition of Taruya for the interconnect of Simpkins in view of the teaching by Simpkins that a ferritic stainless steel material may be used for the interconnect.

Furthermore, the courts have ruled a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Claims to titanium (Ti) alloy with 0.8% nickel (Ni) and 0.3% molybdenum (Mo) were not anticipated by, although they were held obvious over, a graph in a Russian article on Ti-Mo-Ni alloys in which the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni.).

One of skill would have known that the interconnect (for a solid polymer fuel cell) of Taruya could have been used for the interconnect (for a solid oxide fuel cell) of Simpkins. This is evidenced by Woods which teaches a separator suitable for use in

various known types of fuel cells, such as solid oxide fuel cells and polymer electrolyte fuel cells. The separator is generally a ferrous metal separator (column 1). Therefore, Woods teaches a ferrous metal separator for use in either a solid oxide fuel cell or a polymer electrolyte fuel cell.

**(10) Response to Argument**

Applicant asserts there are very significant differences and substantial distinctions between the SOFC recited in the present claims and the subject matter disclosed in Simpkins, Taruya and Woods. Examiner disagrees.

Applicant argues Taruya explains that the components of SOFCs are not interchangeable with the same components from other types of fuel cells because of wide differences in fuel cell operating conditions. Applicant points to [0005-0006] for support. However, the disclosure at [0005] is related to interchanging the electrolyte, fuel electrode and/or oxide electrode materials of different fuel cell types. This section of Taruya does not discuss interconnect materials. Furthermore, [0006] discusses not utilizing phosphoric acid fuel cell or molten carbonate fuel cell materials for polymer electrolyte fuel cells. Simpkins teaches a solid oxide fuel cell having an interconnect that is electrically conductive and comprises a ferritic stainless steel material (6:46-67). Taruya teaches a polymer electrolyte fuel cell comprising a ferrite stainless steel interconnect (abstract). Woods teaches a ferrous metal separator is generally used for known types of fuel cells, such as solid oxide fuel cells and polymer electrolyte fuel cells (column 1). Therefore, one of skill would have known that ferrous stainless steel

interconnects could have been used for SOFCs (taught by Simpkins and Woods) or polymer electrolyte fuel cells (taught by Taruya and Woods).

Applicant argues the Examiner attempts to disprove what is taught by Taruya regarding the lack of interchangeability of fuel cell components by citing Woods. Examiner disagrees. Taruya does not teach the ferrite stainless steel interconnect taught by Taruya cannot be used as the ferrous stainless steel interconnect in the solid oxide fuel cell taught by Simpkins. Simpkins teaches ferrous stainless steel interconnects are used for solid polymer electrolyte fuel cells. Woods is cited as further evidence that ferrous stainless steel interconnects are known for use in both SOFCs and polymer electrolyte fuel cells.

The teachings of Woods regarding molten carbonate fuel cells are not relevant to the claimed invention, the cited references or the rejection of record. Woods does not teach any disadvantages to using ferrous stainless steel interconnect materials in SOFCs and/or polymer electrolyte fuel cells. Furthermore, Woods in only applied to teach ferrous stainless steel interconnects are generally used in SOFCs and polymer electrolyte fuel cells. The interconnect structure of Woods is not relied upon in the rejection of record. Therefore, this argument is not persuasive.

Applicant asserts Simpkins teaches it would be necessary to coat the ferritic stainless steel interconnect to achieve the desired properties for interconnect application. However, Simpkins teaches the ferritic stainless steel interconnect "may be coated", which indicates an optional feature. Furthermore, the claimed invention used "comprising" language and does not exclude a coated interconnect. Examiner points

out that the rejection of record does not rely on Simpkins alone, but on a combination of Simpkins with Taruya as evidenced by Woods.

The table shown on page 21 of the Brief is not commensurate in scope with the teachings of Taruya. The abstract of Taruya recites "Ti not more than 0.2%....Nb not more than 0.3%", which clearly includes the values of 0.2% Ti and 0.3% Nb. Thus the table should recite Taruya teaches  $\leq 0.3$  of Nb and  $\leq 0.2$  of Ti. Furthermore, [0047] clearly recites "Ti is 0.2% *or less*" and [0049] clearly recites "Nb 0.3%". Therefore, a total combined weight percentage of Ti, Nb and Ta of 0.5% is taught by Taruya. Furthermore, the claimed range of Molybdenum (Mo) is encompassed by the range disclosed by Taruya.

Applicant asserts unexpected results for the "recited range", however, unexpected results must distinguish the claimed invention over the prior art of record. The table on page 21 of the specification (and page 24 of the Brief) does not have an alloy containing 0.3% of Nb and 0.2% of Ti, as disclosed by Taruya. Examiner also points out that the table on page 21 is not commensurate in scope with the claimed invention. Taruya discloses an alloy in the "recited range". Therefore, the evidence provided to show unexpected results is not persuasive.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 1795

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/TRACY DOVE/

Primary Examiner, Art Unit 1795

Conferees:

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795

/Jennifer Michener/

QAS, TC1700